Food and Agriculture Organization of the United Nations

POLICY BRIEF – OCTOBER 2024

Scaling Up Carbon Sequestration in Mongolian Rangelands through a Carbon Crediting and Market Mechanism

1 INTRODUCTION

Mongolia has experienced significant climate changes, with the annual mean near-surface temperature rising by 2.46°C between 1940 and 2022, making it one of the fastest-warming countries globally [1]. This rapid change has led to more frequent and severe extreme weather events, such as droughts, heavy rainfall, and harsh winters (dzuds). Mongolia's rangelands, which cover approximately 70% of the country, are crucial carbon sinks and support the livelihoods of herder communities managing over 64.7 million livestock across 112 million hectares [2]. The agriculture sector, particularly livestock, contributes 51.97% (22,390.57 Gg CO_2e) of Mongolia's total greenhouse gas (GHG) emissions, with nearly 98% of these emissions coming from livestock [1]. According to the 2020 National Report on Rangeland Health, the composition of plant species has changed in 70% of Mongolia's grassland areas compared to historical baselines. Additionally, 76.9% of Mongolia's total territory has been affected by desertification to some degree, with desert areas increasing by 2.4%, steppe areas by 2.6%, and dry steppe areas by 13.9% [3]. Soil organic carbon (SOC) is also projected to decline by 18-28% by mid-century, with variation across the country's natural zones [1], [3]. This underscores the urgent need for transformative solutions to mitigate emissions and restore degraded rangelands.

To address these challenges, the Scaling up Climate Ambition on Land Use and Agriculture (SCALA) program, under the UNDP[1], has proposed a Carbon Crediting and Market Mechanism as a strategic approach[2]. This mechanism focuses on enhancing carbon sequestration through sustainable rangeland management, improving the livelihoods of herder communities, and aligning with Mongolia's climate goals under its Nationally Determined Contributions (NDCs) to the Paris Agreement (PA). Therefore, the policy recommendations necessary for the development and implementation of the structural model of the domestic carbon market aimed at increasing the carbon sequestration of rangeland are presented. It can also be further expanded to encompass all economic sectors, positioning Mongolia to establish a comprehensive national carbon crediting and market mechanism.

[1] The Support Programme on Scaling up Climate Ambition on Land Use and Agriculture through NDCs and NAPs (SCALA) is implemented through a joint effort between the FAO and the UNDP.

[2] Under SCALA's Outcome 1, a systems-level assessment of the country to measure carbon sequestration potentials by pasture classification or ecological site potential was carried out for implementation of transformative climate action in land-use and agriculture sector in line with Mongolia's NDC. Within this assessment, the development of a 'National carbon market scheme in pasture carbon sequestration' was being pursued along with strategic policy recommendations for the related stakeholders by an individual consultant.

Carbon Sequestration Potential in Mongolian Rangelands

Mongolia's rangelands offer significant carbon sequestration potential, particularly in soil organic carbon (SOC). Globally, soils represent one of the largest carbon pools, with an estimated 1,500 to 2,400 gigatons (Gt[3]) of carbon stored in the top meter of soils. The lower estimate in the range is approximately three times the stock of C in vegetation and twice the stock of C in the atmosphere [4]. For Mongolia, studies by the Information and Research Institute of Meteorology, Hydrology, and Environment (IRIMHE) have shown considerable variation in SOC content across regions. The highest SOC levels are found in the high mountain regions, with 59.07 tons of carbon per hectare (t C/ha), while desert regions have lower levels, around 28.24 t C/ha [1].

Projections indicate that improved grazing management could significantly enhance SOC sequestration. Research by Chang et al. using the Century model estimated that reducing grazing intensity could result in SOC accumulation rates of 0.22 to 0.369 t C/ha annually in Mongolia's forest-steppe grasslands [5]. The Global Soil Organic Carbon Sequestration Potential Map (GSOCseq) also identifies potential for SOC sequestration under sustainable soil management practices. Estimates suggest that Mongolia could sequester approximately 4.69 million tons of carbon (Mt C) per year through such practices with rate of 0.103 t C/ha yearly [6].

2 KEY FEATURES OF PROPOSED MONGOLIA'S DOMESTIC CARBON MARKET (MDCM)

Voluntary but Government-Regulated Mechanism: The MDCM is designed as a voluntary crediting system with government regulation. While participation is voluntary, the government oversees the verification, issuance, and trading of carbon credits to ensure transparency, accountability, and alignment with national policies. This allows flexibility for early-stage participation while preparing Mongolia for future integration into compliance markets.

Hybrid Reward System: The MDCM employs a hybrid reward structure that combines action-based and result-based approaches. Action-based credits provide quicker financial returns, incentivizing early adoption of sustainable practices. Meanwhile, result-based credits offer long-term accuracy and rewards based on the actual amount of carbon sequestered.

National and International Trading: The MDCM allows for the generation of carbon credits that can be used to meet Mongolia's NDC targets or traded domestically or internationally. Credits generated through the MDCM can be authorized for international transfers under Article 6 mechanisms of the PA. Corresponding adjustments will be applied to ensure transparency and avoid double counting.

Monitoring, Reporting, and Verification (MRV): The MDCM integrates a robust MRV system aligned with national and international standards[4], ensuring accurate rangeland and carbon sequestration assessments while simplifying participation.

Non-Market Approaches (Article 6.8): Mongolia will also leverage non-market approaches to foster cooperation on sustainable rangeland management and capacity building. These initiatives support adaptation and resilience without requiring carbon market transactions or corresponding adjustments.

[3] 1 Gt = 1 PG = 1 billion metric tonnes

[4] The Mongolian Agency for Standardization and Metrology (MASM) has officially adopted several key ISO standards into the Mongolian MNS standard framework, which are crucial for the development and verification of carbon projects and activities. These standards include: (1) ISO 14064-1:2018 - Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals. (2) ISO 14064-2:2019 - Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements. (3) ISO 14064-3:2019 - Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.

3 STRUCTURE AND OPERATIONAL PLAN OF THE MDCM

The authority responsible for climate issues is the Ministry of Environment and Climate Change (MECC)[5], which will oversee and coordinate the MDCM and align it with the NDCs and other national policies. Additionally, it will be responsible for managing the national carbon market registry system. The National Climate Committee (NCC) will act as the high-level decision-making body. It will also provide technical and policy recommendations through subcommittees and technical advisory group[6]. The Carbon Market Office (CMO) will be responsible for daily operations, such as registering projects, approving and canceling methodologies, registering third-party verification bodies, issuing and retiring credits, and collaborating with other stakeholders (Figure 1).

Key decisions will begin with the CMO submitting them to the relevant sector subcommittee. If approved, they will be presented to the NCC for final approval, following a step-by-step process.

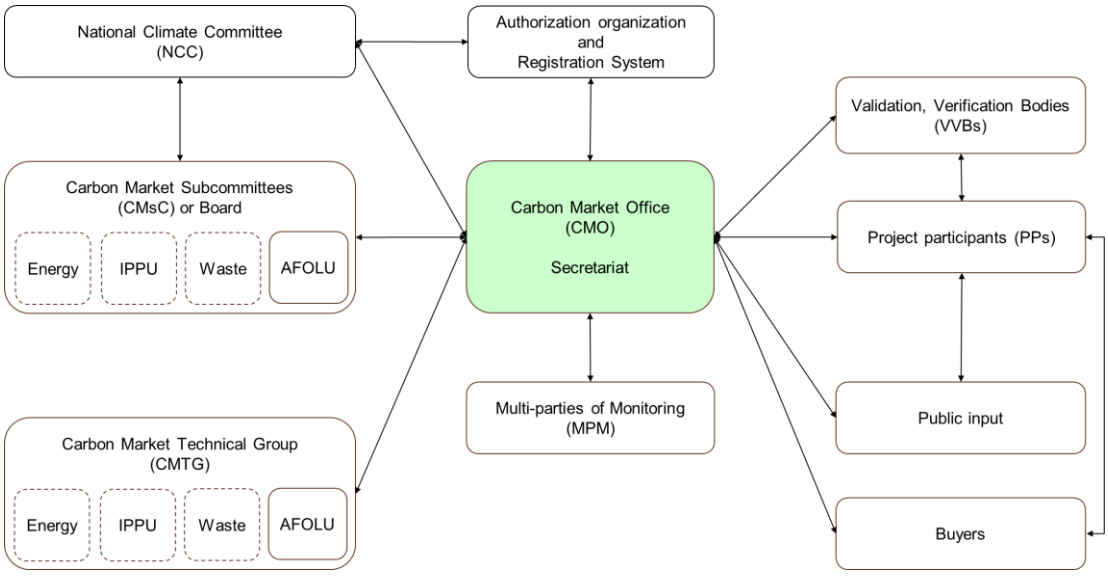

Figure 0-1 MDCM management structure

Operational Cycle

The MDCM follows a structured project cycle that includes project submission, approval, implementation, and credit issuance.

1. Herder federations, project developers can submit rangeland carbon sequestration projects.
2. Projects will be evaluated based on sustainability criteria, alignment with national policies, and compliance with environmental and social safeguards.
3. Once verified, carbon credits will be issued and tracked in the National Carbon Market Registry.
4. These credits can be used to meet Mongolia's NDC targets or traded domestically and internationally.

The MDCM promotes flexibility in project implementation, allowing various sustainable rangeland management practices to be adopted, such as Resilience-Based Rangeland Management (RBRM) [3], [8], implemented by 98,000 herder households and 1,600 Pasture User Groups (PUGs) to enhance rangeland resilience as of 2023

[5] According to Law on Air

[6] The National Climate Committee (NCC), re-established in 2023, chaired by the Deputy Prime Minister, coordinates climate action across sectors and regions. The NCC has the authority to establish sub-committees and professional councils to support its work. A professional council was established on April 1, 2024, consisting of 22 members, to provide expertise and guidance on national climate strategies. The NCC also engages local governments through its provincial branches, ensuring climate initiatives are implemented nationwide.

[9]. The mechanism encourages innovation and broad participation, supporting herder communities and fostering scalable carbon sequestration activities. This system has the following advantages:

- To ensure credibility, the MDCM employs a robust MRV system, integrating national monitoring networks like National Agency Meteorology and the Enviromental Monitoring (NAMEM) and Agency for Land Administration and Management, Geodesy and Cartography (ALMGaC).
- This system ensures accurate assessments of rangeland health and carbon sequestration. Local communities and provincial authorities are given flexibility to conduct independent monitoring, provided they meet MRV standards.
- This balance between national oversight and local control maintains the integrity of the carbon credits while simplifying participation for stakeholders.

A detailed description of the operational phases of the Carbon Market Mechanism (CMM) is provided in the main report.

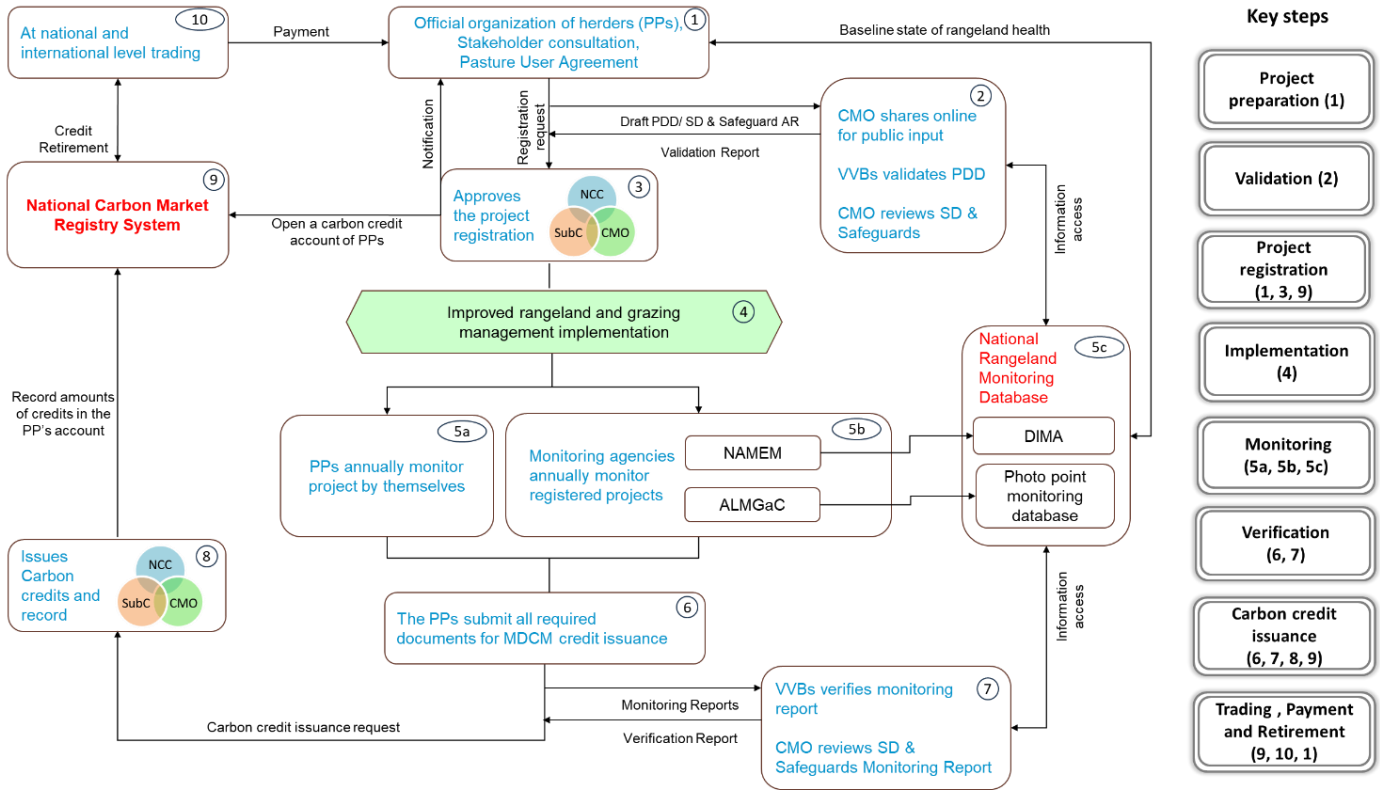

Figure 3-2 Project development cycle of MDCM in rangeland carbon sequestration projects (Abb:NCC – National Climate Committee, SubC – Subcommittee or Board, CMO -Carbon Market Office)

4 POLICY RECOMMENDATIONS

Comprehensive Legal Framework for Carbon Market Activities

1. Develop a comprehensive legal framework to support the development and operation of its carbon crediting and marketing mechanism. This could involve updating or harmonizing existing laws and policies, such as the Law on Air and the Climate Change Law (under development), ensuring alignment with Mongolia's NDC, National Adaptation Plan, and Vision 2050.
2. The legal framework should clearly define carbon credit ownership and transfer rules, ensuring clarity for all stakeholders.
3. Establish enforcement and dispute resolution mechanisms to ensure compliance and resolve conflicts, strengthening Mongolia's legal foundation for carbon markets.

Strengthen Institutional Capacity and Coordination

1. Establish a Carbon Market Office (CMO) ideally under the Ministry of Environment and Climate Change to manage MDCM operations. Clear roles and responsibilities should be defined for the CMO as a secretariat.
2. It is also important to define the roles and responsibilities of the National Climate Committee (NCC) for implementing high-level oversight, the subcommittees responsible for overseeing the project registration and carbon credit issuance process, and the technical advisory groups tasked with developing and approving methodologies, tools, and emission factors for calculating project results and greenhouse gas emissions and sequestration.
3. Additionally, designating Validation and Verification Bodies (VVBs) and monitoring organizations is crucial to ensure all carbon projects meet established standards, enhancing transparency and accountability in the carbon market.

Comprehensive Documentation, Registry, and Communication Systems

1. Develop clear guidelines, online forms and a detailed methodology framework to standardize carbon market activities, including project registration, MRV compliance, GHG emission reduction quantification, and carbon credit issuance.
2. Accessible documentation is essential to ensure transparency and encourage participation from all stakeholders.
3. Establish a national carbon market registry system within the CMO would enable tracking of all credits, registrations, and transactions, providing verifiable records for national and international reporting, including to the UNFCCC.
4. Finally, creating a public communication channel would foster stakeholder engagement, promote transparency, and build trust in the carbon market system.

Monitoring, Reporting, and Verification (MRV) Systems

1. Upgrade national MRV systems to comply with the requirements of the PA and international carbon market standards, ensuring accurate monitoring of emissions reductions and carbon credits.
2. Strengthening national and local monitoring networks, such as NAMEM and ALMGaC, will enhance grassland condition tracking and support carbon accounting efforts.
3. Leverage cost-effective MRV technologies, such as remote sensing and field surveys, can make monitoring more efficient and accessible, particularly in remote areas like rangelands.
4. Supporting the involvement of NGOs and the private sector by providing training and resources will help increase capacity and foster a diverse pool of qualified actors for monitoring and verification processes.

Strengthen SOC Measurement Capacity and Research

1. Enhance capacity to measure Soil Organic Carbon (SOC) by addressing gaps in human resources and technical capabilities. This will improve the accuracy of carbon sequestration assessments in rangelands.
2. Supporting research on the sequestration potential of rangelands and the effectiveness of various land management practices will contribute to better carbon accounting and policy development.
3. Promote technological innovation, such as remote sensing and GIS, can further enhance monitoring and verification processes.
4. Encouraging gender-focused research on roles and challenges in rangeland management can ensure equitable participation and benefit-sharing in carbon market activities.
5. Collaboration with research institutes will be essential in driving these efforts forward.

Develop Financial Mechanisms and Incentives

1. Create a voluntary carbon pricing system to incentivize emissions reductions and establish a foundation for more formal mechanisms like an ETS or carbon tax.
2. Establishing a reward system based on the accuracy of carbon credit and soil organic carbon assessment and calculation methodology.
3. Expanding green finance initiatives, including loans and grants, will support sustainable investments. Strengthen the National Green Taxonomy to provide clear guidelines for sustainable projects, encouraging investments that generate carbon credits or reduce emissions.
4. Public-private partnerships (PPP) can mobilize funding for key projects, while gender-specific financial products can help address barriers faced by women in carbon market participation.

Strengthen Stakeholder Engagement and Capacity Building

1. Actively engage herder communities, the private sector, and government agencies in MDCM planning to ensure equitable distribution of carbon market benefits. Developing gender-responsive strategies will promote women's equal participation in decision-making and capacity-building.
2. Outreach campaigns should raise awareness of carbon markets and sustainable land management.
3. Providing training to key actors, such as government officials and local authorities, in areas like MRV and carbon accounting will build capacity.
4. Finally, integrating gender perspectives and ensuring gender-specific indicators in MDCM activities will promote inclusive participation and equitable outcomes.

Strategic International Cooperation

1. **Bilateral and Multilateral Engagement**: Strengthen Mongolia's engagement in international climate initiatives to gain access to technical assistance, funding, and global carbon markets. Collaboration with donor organizations and countries can provide the expertise and resources.
2. **Align with Global Standards**: Ensure that the MDCM aligns with global standards such as the IPCC, the Gold Standard and Verified Carbon Standard and relevant ISO standards.
3. **Article 6 Collaboration:** Mongolia could explore collaborations under Article 6 of the PA, focusing on Internationally Transferable Mitigation Outcomes (ITMOs) to enable carbon credit trading while safeguarding national climate goals. By defining the credits contributing to Mongolia's NDC and those eligible for international trading through the Carbon Market Participation Strategy, the country can ensure transparency and compliance with international standards.

5 CONCLUSIONS

Mongolia's Domestic Carbon Market (MDCM) offers a vital opportunity to leverage rangeland carbon sequestration for both national climate goals and international carbon market participation. By aligning the MDCM with global standards, exploring Article 6 collaborations, and building strong institutional frameworks, Mongolia can create a transparent, credible system for carbon credit generation and trading. Through strategic investments in MRV systems, stakeholder engagement, and financial mechanisms, the MDCM can support sustainable rangeland management, enhance livelihoods, and position Mongolia as a proactive player in the global climate agenda. Strengthening capacity at the national level will be key to unlocking the full potential of the MDCM and ensuring long-term success in meeting both domestic and international climate commitments.

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DISCLAIMER

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Country support includes strengthening policies, adopting innovative approaches to climate change adaptation, and removing barriers related to information gaps, governance, finance, gender mainstreaming and integrated monitoring and reporting. To achieve this shift, the programme will engage the private sector and key national institutions.

SCALA supports countries to develop the capacity to own and lead the process to meet targets set out in their National Adaptation Plans and Nationally Determined Contributions under the Paris Agreement, and to achieve the Sustainable Development Goals. The SCALA initiative builds on another FAO-UNDP led programme, Integrating Agriculture in National Adaptation Plans (2015-2020) which is currently phasing out.

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